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FOSSIL UNGULATE MAMMALS DEPICTED ON ARCHAEOLOGICAL ARTIFACTS

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ABSTRACT: New evidence is presented of archaeological artifacts that may depict fossil ungulate species that survived into relatively recent (historical) times. Following Colbert's (1936) report of the depiction of a probable sivathere on a Sumerian chariot ring, further evidence indicates possible depictions of the sivathere genus *Bramatherium* on a variety of Eurasian artifacts. Other possible depictions of extinct ungulates include a chalicothere from the Siberian frozen tombs (500–400 B.C.), a giant aquatic hyrax (*Pliohyrax*) from a sculpture from the late Chou Dynasty of China (600–500 B.C.), and a Pleistocene antelope (*Mesimbroportax*) from a recent African Tji Wara sculpture.

INTRODUCTION

The term "ungulate" means "bearing hooves"; that is, with the terminal digit on the limbs being covered by a horny structure composed of keratin, that is used for bearing the animal's weight. The possession of hooves on the feet is a derived condition for animals, and was evolved from the type of keratinous claw that characterizes the terminal digit of most land vertebrates. (The flat nail possessed by primates is another modification of this primitive type of claw, although here the modification is obviously not as extensive as in the development of a hoof.)

The term "ungulate" is habitually used to refer to hoof-bearing mammals, such as horses and cows. Although mammals are the only living vertebrates that bear hooves, this was not always the case in the past. Hoof-like structures were also characteristic of dinosaurs in the order Ornithischia, such as the horned *Triceratops,* and were also seen in certain other extinct reptiles, such as the early Tertiary terrestrial sebosuchian crocodiles. It seems that hooves are evolved in certain large animals (i.e., over 5 kg in body weight), that have adapted their limbs for relatively fast locomotion, and that stand with a limb position equivalent to that of a ballet dancer standing on point (the technical term for this is "unguligrade"), so that the terminal digit is the only part of the foot that bears the animal's weight. Most, but not all, hooved vertebrates were herbivorous.

Present-day ungulate mammals belong to the orders Artiodactyla (pigs and related animals such as hippos, cattle, antelope, deer, and giraffe) and Perissodactyla (horses, rhinos, and tapirs). Some other living mammal groups are usually termed "subungulates," presumably because their hooves are not as well defined as the true ungulates. These comprise the related orders

Proboscidea (elephants and their fossil relatives, such as mastodonts), Hyracoidea (hyraces, small rabbit-like animals which are probably best known as the "conies" mentioned in the Bible), and Sirenia (sea cows, which have obviously secondarily lost their hooves in the process of becoming aquatic). Hyraces resemble large rodents, but are in actual fact small ungulates with nail-like hooves, four on the front foot, and three on the back foot. They have what is termed a "digitigrade" foot stance (i.e., standing on the human equivalent of tiptoe, like a dog or a cat), rather than the unguligrade stance of other living ungulates.

Extinct ungulate orders include the South American Notoungulata and Litopterna, and the rather poorly defined early Tertiary Condylarthra, which is assumed to be the "basal stock" for all other ungulate and subungulate orders—although this issue is still in dispute, and the "condylarths" probably do not represent a distinct unified lineage (Prothero, Manning, and Fischer 1988). All hooved mammals (with the exclusion of the extinct order Pantodonta) have recently been shown to be a "monophyletic clade" (i.e., to all have a common ancestor). Indeed, the various "subungulate" orders are more closely related to perissodactyl ungulates than to artiodactyls (Prothero, Manning, and Fischer 1988). Thus, it is now appropriate to use the term "ungulate" to refer to almost all hooved mammals.

The best known description of fossil ungulate that may have survived into historical times, as documented by its apparent depiction in the archaeological record, is that by Edwin Colbert (1936) of a sivathere (a type of giraffe), depicted on an artifact from Iraq dated at 3500 B.C. A published account also exists of a possible example of "Irish elks" (genus *Megaloceros*) depicted in artifacts from the Black Sea region dated at around 600–500 B.C. (Bachofen-Echt 1937), although the last fossil evidence of this animal is from the end of the Pleistocene, about 10,000 years B.P. There are also some reports, as yet unconfirmed, of *Megaloceros* bones recovered from somewhat later Holocene deposits (Vereshchagin and Baryshnikov 1984), and some reports exist of the animal's possible persistence into the Middle Ages in Ireland. I have also observed that a deer depicted in cave paintings at Lascaux may represent the extinct fossil genus *Eucladoceras* (Brodrick 1972: 12).

Numerous accounts also exist of fossil proboscideans surviving into recent times, and of especial interest are those documenting the existence of elephantids (or elephant-like animals) in North and Central America. According to the fossil record, proboscideans first appeared in North America in the middle Miocene, approximately 16 million years B.P., as immigrants from the Old World. They migrated into South America in the Pleistocene with the development of the isthmus of Panama, and their last recorded appearance in both continents dates from approximately 10,000 years B.P. (Agenbroad 1984). Accounts of surviving elephantids include reported

sightings during the last millennium (Eberhart 1983, Lankford 1980), and various archaeological artifacts depicting "elephants" (Farquharson 1879, Elliot Smith 1915). I do not propose to discuss the possible survival of New World proboscideans into recent times in this paper, although it is a fascinating topic that has been much discussed in the literature, and deserves an entire paper in itself.

My intention in this paper is not to review the existing literature on the possible survival of fossil ungulates into historical times, but, rather, to present new examples of archaeological artifacts possibly depicting such. I would like to stress that none of these examples are ones that I set out to discover; on the contrary, they represent instances that have "turned up" in my everyday life, and that were of interest to me because of my research in ungulate paleontology. This suggests that there may be a wealth of further examples of fossil animals represented in archaeological artifacts or artwork awaiting a concerned researcher in cryptozoology. I present here some further examples of possible sivatheres, and examples of artifacts that may depict a chalicothere, a giant hyrax, and a Pleistocene antelope.

Sivatheres

Sivatheres represent the subfamily Sivatheriinae of the artiodactyl family Giraffidae. The other giraffid subfamily, the Giraffinae, contains two living genera (although it had a much greater diversity in the past), and okapi, *Okapia johnstoni,* and the giraffe, *Giraffa camelopardalis.* Sivatheres are known from the latter part of the Miocene (approximately 15 million years B.P.) through the Pleistocene in both African and Eurasian deposits, and are moderately diverse in the fossil record. In life, they differed from giraffes in being more heavily proportioned, with shorter legs and necks, and had branching, palmate ossicones (cranial appendages that were skin-covered and non-deciduous, in contrast to structures such as naked, deciduous deer antlers, or keratin-covered, non-deciduous bovid horns). Most genera were of similar body proportions to a moose or an ox. They differed from giraffines in the palmation of the ossicones (resembling the condition seen in moose antlers), and the possession of an additional pair of frontal ossicones in front of the main postorbital ones. These frontal ossicones were small structures in the genus *Sivatherium* but were large, and joined together to form a single median structure in the genus *Bramatherium.*

Colbert (1936) described a Sumerian copper chariot ring in the Field Museum of Natural History, Chicago, from Kish, Iraq (3500 B.C.), that depicts a small statuette of an animal (Fig. 1a) that had been previously assumed to be some kind of deer, as it possessed branched, palmated "antlers." Colbert pointed out, however, that these "antlers" bore a close resemblance to the ossicones of *Sivatherium* (Fig. 1b). He also noted a number of

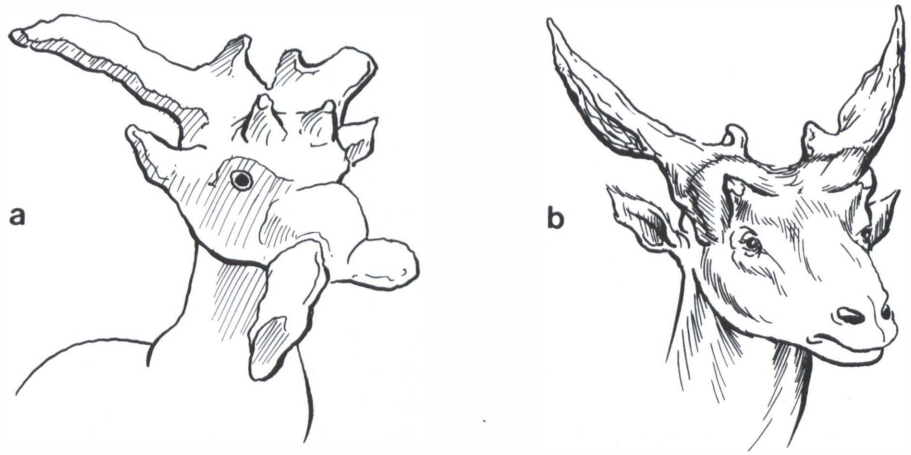

FIG. 1.—a. Statuette on Sumerian copper chariot ring. (From Colbert 1936.) b. Reconstruction of a sivathere head. (From Colbert 1936.)

other sivathere-like features of the statuette, such as the additional pair of small ossicones (which are not seen in any known Recent or fossil deer), and the moose-like short, bulbous snout. Colbert commented that, although the genus *Sivatherium* is known primarily from the Pleistocene of India, it is also known from both India and Africa in association with human artifacts in the Paleolithic, and he suggested that it may have persisted into relatively recent times and may even have been domesticated, as suggested by the representation of a "halter" on the statuette. Savage and Long (1985) also comment on the likelihood of the survival of sivatheres into the early Holocene. In addition to the statuette described by Colbert, Savage and Long present a petroglyph of a possible sivathere from a rock shelter in the Tibesti mountains, central Sahara, dating from approximately 6000 B.C.

A casual visit by the author to the British Museum, London, revealed a surprising number of "sivathere-like" artifacts, most of which could be distinguished by the possession of a single, median cranial appendage resembling the condition in the genus *Bramatherium.* (It is clear, however, that these examples do not represent as strong a case as Colbert's Sumerian statuette.) Although I am aware that these new examples could well represent instances of "artistic license"—and I have not made a study of the types of artistic stylization of the various periods that these examples are from—I should point out that the artifacts were found among others that do accurately depict animals with cranial appendages that were obviously cattle-like horns or deer-like antlers. I present these examples here merely as "additional possibilities" of sivatheres, which gain their strength from the existence of previous, more convincing examples. (As a cautionary tale on relying on

museum identifications of animals depicted in archaeological artifacts, I would like to cite the case of a Roman mosaic in the British Museum that depicts animals termed "deer" that are quite clearly reedbuck antelope, genus *Redunca,* that are unknown outside of Africa!)

In Fig. 2 we see a sketch of the skull of *Bramatherium* on display at the American Museum of Natural History, New York. Fig. 3a depicts a recently made stone statuette, purchased at a Russian tourist shop in 1977, that is apparently of a deer, yet possesses a median, palmated "antler." Fig. 3b shows an ivory "stag" from Syria (from approximately 200 B.C.), and Fig. 3c shows a bronze "cow" from Egypt (from approximately 600 B.C.), both artifacts on exhibit at the British Museum. Both animals also possess a *Bramatherium*-like medial cranial appendage. In 1974, I examined a book on children's toys in the Soviet Union (one that I have unfortunately been unable to relocate) that depicted tin whistles from Siberia in the shapes of various animals. These took the form of a ram, a goat, and a "deer," but while the horns on the ram and the goat were realistically portrayed, the deer possessed a median, palmate "antler" resembling the animal depicted in Fig. 3a. While I would not vigorously dispute the interpretation that these recent artifacts merely represent a conventionalized styling of deer antlers, and would not venture to suggest that *Bramatherium* survives today in the Soviet Union, the possibility remains that the stylized convention reflects a folk memory of an animal with cranial appendages of this type that existed in the area until relatively recently.

Chalicotheres

The family Chalicotheriidae belongs in the order Perissodactyla, and contains taxa that were mainly of large (cow to giraffe) size. Chalicotheres are known from the Eocene (approximately 45 million years B.P.) through the middle Pleistocene over most of the Northern Hemisphere (although they became extinct in North America in the Miocene, approximately 15 million years B.P.). They were rather horse-like in appearance—especially the head—but had secondarily substituted large claws for hooves, which they probably used to pull down tree branches to within access (Coombs 1982), and had a somewhat hyaena-like posture, with the front legs longer than the back ones (Fig. 4). Two main forms (subfamilies) of chalicotheres existed: the schizotherines, that were more horse-like in proportions, with longer hind legs and a longer face; and the chalicotherines, that were more hyaena or gorilla-like in proportions, with longer fore limbs and a shorter face. Both schizotherines and chalicotherines were found in the Old World until the middle Pleistocene, but only schizotherines were found in North America (Coombs 1982). The chalicothere depicted in Fig. 4 is based on the genus *Moropus,* a schizotherine from the middle Miocene of North America.

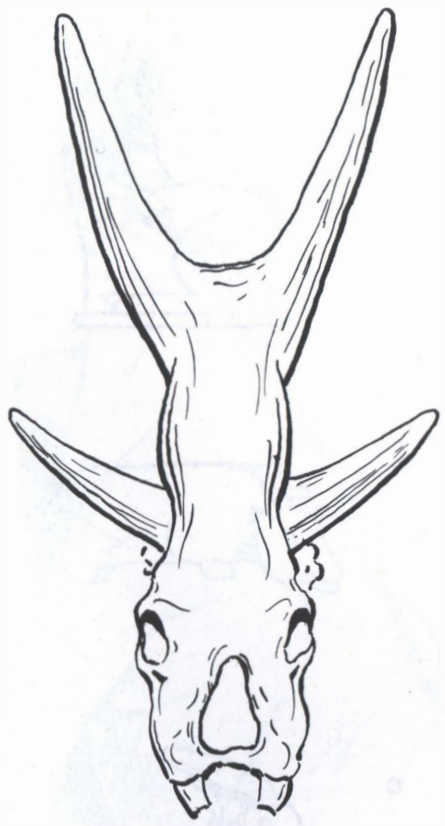

FIG. 2.—*Bramatherium* skull (AMNH 32603) on display at the American Museum of Natural History, New York.

Heuvelmans (1958) made the suggestion that a surviving chalicothere might be behind the East African legend of the "Nandi Bear" or *chemosit.* The chalicothere certainly agrees with the visual descriptions of the Nandi Bear, a large, stocky animal with high shoulders and a sloping back, no visible tail, and a rather long, pointed snout, that occasionally stood up on its hind legs. The Nandi Bear was also variously described as possessing a hairy mane, which is typical of certain living perissodactyls (such as horses and American tapirs). It seems unlikely, however, that a herbivorous chalicothere could have been responsible for the type of ferocious killings ascribed to the Nandi Bear, and Heuvelmans suggested that such incidents might actually have been the work of some other local animal, and then ascribed to the occasionally glimpsed chalicothere—which may have been *assumed*

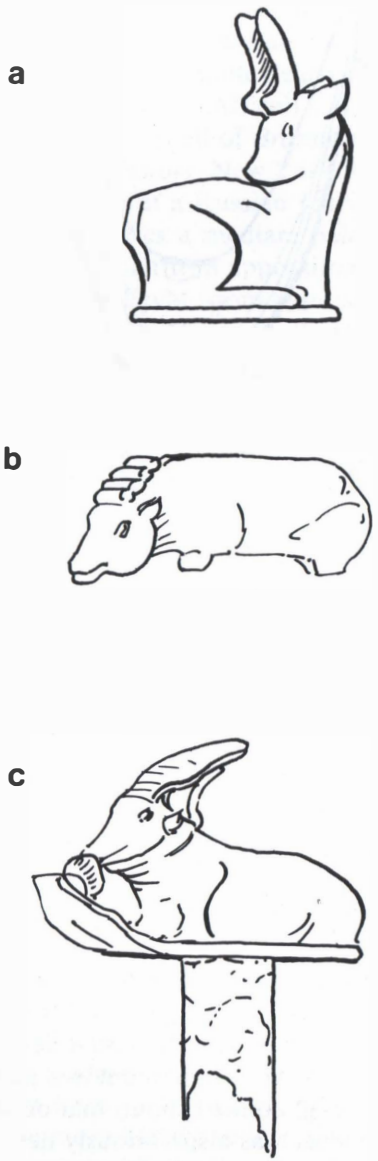

FIG. 3.—a. Stone statuette from Russia (recent). (Property of author.) b. Ivory "stag" from Syria (from approximately 200 B.C.) on display at the British Museum, London. c. Bronze "cow" from Egypt (from approximately 600 B.C.) on display at the British Museum, London.

FIG. 4.—Representation of a chalicothere, based on the North American Miocene genus *Moropus*.

to be carnivorous due to its large size, impressive claws, and hyaena-like posture.

Martin Pickford, a British paleontologist, also commented on Heuvelmans' idea of equating a surviving chalicothere with the Nandi Bear (Pickford 1975). When Pickford was working in Kenya on the description of a new chalicothere fossil (ascribed to the species *Ancylotherium hennigi*) from the Lukeino formation (African Miocene, approximately 6.5 million years B.P.), he verbally described what the living animal might have looked like to his Kenyan field assistant. Curiously, the assistant assured him that this animal was just like a *chemosit* (the original native name for the Nandi Bear), an animal well known by repute, and this view was later repeated by other local Kenyans. Other paleontologists have also commented on the possibility of a chalicothere surviving in Africa until at least relatively recent times (Andrews 1923, Leakey 1935, Savage and Long 1985). However, Pickford's *Ancylotherium* is a schizotherine chalicothere, and it has generally been assumed that, if the Nandi Bear reports were indeed attributable to a chalicothere, it would be to a chalicotherine type, as this animal would better fit the description of bear- or hyaena-like proportions (Heuvelmans 1958). The chalicotherine genus *Chalicotherium* is known only from the middle Miocene of Africa, and the chalicotherine genus *Nestoritherium* is known from the Pleistocene of Eurasia.

My own evidence for a chalicothere surviving into historical times comes not from Africa, but from the frozen tombs of Siberia (the Sakic culture, dated as 500–400 B.C.). Zavitukhina (1978) illustrates two belt plaques from the collection of Peter the Great in the Hermitage, Leningrad, depicting "fabulous wolf-like animals" (Fig. 5). However, this animal looks surprisingly chalicothere-like, as it appears to combine a horse-like head and body (including the presence of a horse-like mane) with clawed feet. In contrast to the type of chalicothere assumed to be behind the reports of the Nandi Bear, the proportions of this animal suggest a schizotherine (or horse-like) chalicothere. Schizotherines were not known beyond the end of the Miocene in Eurasia, but *Ancylotherium* survived in Africa until the middle Pleistocene. Additional features include the suggestion of a small proboscis (the retracted nasal bones of certain chalicotheres suggest that they might have possessed a tapir-like proboscis), and a long tail (which was not a feature of chalicotheres). While this animal could represent a stylized wolf, other belt plaques from the same collection depict animals that *are* clearly dogs or foxes, with pointed muzzles, triangular ears, no mane, and a tufted tail—all in contrast with this supposed "wolf."

The main problem with the interpretation of this animal as a possible chalicothere is the presence of a long tail. However, the animal does not bear a resemblance to any known fossil or living carnivore, and its general

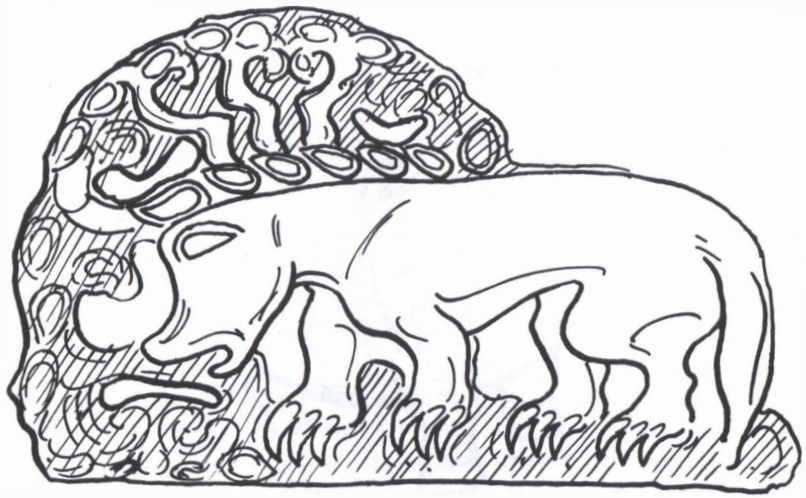

FIG. 5.—Gold belt plaque of "fabulous wolf-like animal" from the frozen tombs of Siberia (Sakic culture, 500–400 B.C.), in the collection of Peter the Great in the Hermitage, Leningrad, U.S.S.R. (Si 1727 1/19). (Drawn from photograph in Zavitukhina 1978.)

appearance suggests the depiction of a horse with claws. Perhaps the animal was not directly known to the artist, but had survived in folklore as an animal with "a horse-like head and body, but with wolf-like claws," which could account for the reconstruction of the animal with a long horse-like tail. Again, my role here is as a paleontologist, and I am not in a position to discuss possible artistic styles or the animal folklore or mythology of the period. The best that I can say is that it looks like a chalicothere to me! Once again, the argument is strengthened by other accounts of possible surviving chalicotheres.

These "surviving chalicothere" examples are weakened by the available fossil evidence, inasmuch as schizotherines were the surviving African Pleistocene chalicotheres, while chalicotherines were the Eurasian Pleistocene forms, yet these examples suggest an Asian schizotherine and an African chalicotherine! Chalicotheres are rare as fossils, however, and in more recent (post Miocene) sediments they are usually identified only by isolated elements. Moreover, land connections between Africa and Eurasia have existed since the middle Miocene, and both types of chalicotheres *did* survive in the Old World in the Pleistocene. Thus, it is not impossible, in terms of paleobiogeography, that, in more recent times, a schizotherine chalicothere species could have migrated into Asia, and a chalicotherine chalicothere species could have migrated into Africa, even if one would like the fossil record to be more supportive of all this cryptozoological evidence. In con-

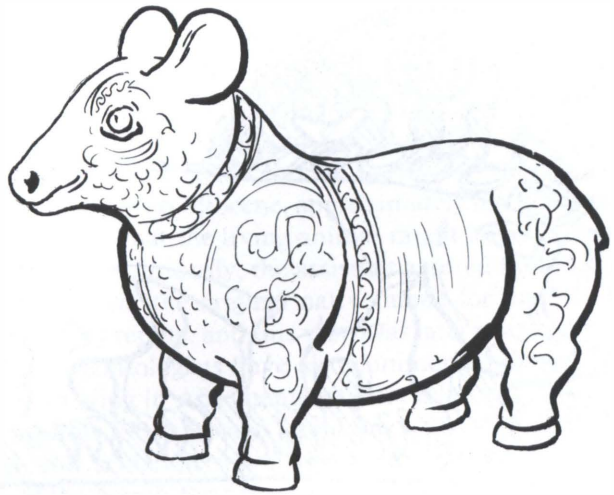

FIG. 6.—Bronze statuette of hyrax-like quadruped from the late Chou Dynasty (600–500 B.C.), China, on display at the Freer Gallery of Art, Smithsonian Institution, Washington, D.C. (From reproduction cast, property of author.)

trast, a report of a "surviving chalicothere" in South America would be an extremely dubious claim, as they are not known from that continent at all; they are believed to have become extinct in North America long before the formation of the Panamanian land bridge linking North and South America.

A Giant Hyrax

In Fig. 6, we see a bronze statuette from the Freer Gallery of Art (Smithsonian Institution), Washington, D.C., from the late Chou Dynasty of China (600–500 B.C.). Several of these statuettes were found in 1923 near the village of Li-yu, in the Shanxi Province. An issue of *Smithsonian* magazine once described this animal as follows: "Fanciful tapir-like beast (that) seems to have had no practical or ritual function." The artifact depicts an animal that appears to combine the head of a hyrax with the body of a hippo, but possessing horse-like single hooves and a short, hippo-like tail (the tail is lacking in living rock hyraces, but a small tail is present in the tree hyrax, and may have been present in extinct taxa).

Hyraces are known today from Africa and Asia Minor, but in the Pliocene (5 to 2 million years B.P.) they were widespread across southern Eurasia, and they exhibited a much greater diversity of body size and form than is seen today. A recent Asian rock hyrax, *Procavia habessinica* is depicted in Fig. 7. Of special interest is the existence of a (relatively) giant hyrax from the late Pliocene (Villafranchian) of China, *Pliohyrax*. An undescribed skull of this animal from the collection of the American Museum of Natural

FIG. 7.—A recent rock hyrax (*Procavia habessinica*).

History is shown in Fig. 8. This skull is approximately 25 cm in length, and the animal would have been about the size of a large pig (present day hyraces are rabbit-sized). It also seems likely that this animal was semi-aquatic. Although no post-cranial remains are known, the high position of the orbits is reminiscent of that condition in the hippo, and it is also seen in other fossil ungulates that are known to have had hippo-like bodies and dense bone typical of semi-aquatic animals (for example, the Miocene rhinoceros *Teleoceras*). The relatively high position of the orbits in the skull of the hippo places the eyes near the top of the head, enabling the animal to rest in the water almost fully submerged but with the eyes uncovered. Similar adaptations can be seen in other semi-aquatic animals, such as crocodiles.

Pliohyrax appears to be a likely candidate for the Chinese sculpture. The head of the statuette is clearly hyracoid, and the head of *Pliohyrax* (Fig. 8) shows similar proportions to a living hyrax. The head of the statuette shows no resemblance to a tapir, as it lacks a proboscis-like snout, and is unlike a hippo in the large size of the ears. Additionally, the hippo-like body proportions of the statuette suggest a semi-aquatic mode of life. The limb stance is more pillar-like than in living hyraces, but that would be expected in a larger-sized animal. I would suggest that the statuette was a representation of an animal known from mythology, rather than one personally seen by the artist, as the horse-like single hooves are anomalous.

A Pleistocene Antelope

A reproduction of an African Tji Wara, or agricultural antelope god, appears in Fig. 9. The country of origin is unknown, but the style suggests East Africa (probably Kenya) rather than West Africa. Most other Tji Waras that I have seen clearly represent a stylized sable antelope, *Hippotragus niger,* recognizable by horns that are convexly curved and that project backwards without lateral divergence. The form of the horns on this artifact bears no close resemblance to any known African antelope, but it does resemble a longer version of the type of horn seen in the Indian nilgai, *Boselaphus*

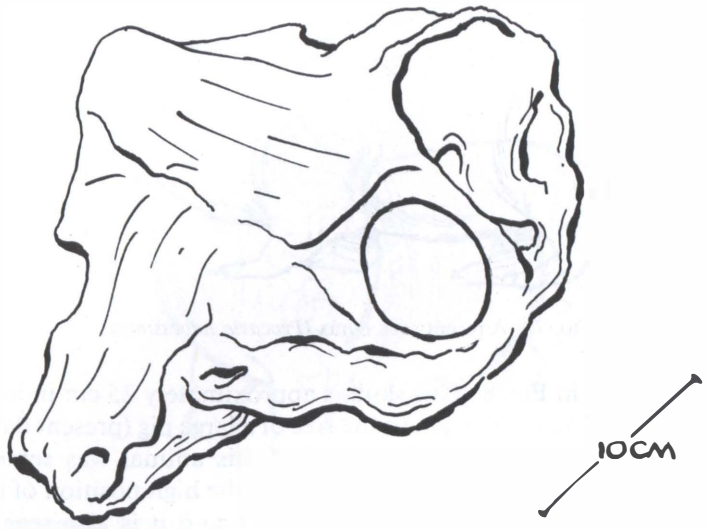

FIG. 8.—*Pliohyrax* skull (AMNH 99375) in the collections of the American Museum of Natural History, New York.

tragocamelus. The living African antelope which might fit this representation are the oryx, *Oryx gazella,* in which the horns may project slightly laterally but are more convex in outline, and the waterbuck, *Kobus ellipsiprymnus,* in which the horns have a stronger lateral projection and are more definitely concave. However, both of these living antelope have broad muzzles. The narrow muzzle seen in this sculpture is more reminiscent of the head of the nilgai.

Interestingly enough, a close relative of the nilgai, the genus *Mesimbroportax,* existed in Africa during the Pleistocene, and this animal had horns that were identical to those portrayed in this artifact. Again, while I would not categorically assert that this artifact *must* represent a surviving memory of *Mesimbroportax,* I find it intriguing that the resemblance is so close, and that the animal bears no obvious resemblance to any living African antelope species, in contrast to all the other examples of Tji Waras I have seen.

CONCLUSIONS

With the possible exception of the giant hyrax, none of these new descriptions carry quite the strength of Colbert's (1936) description of *Sivatherium.*

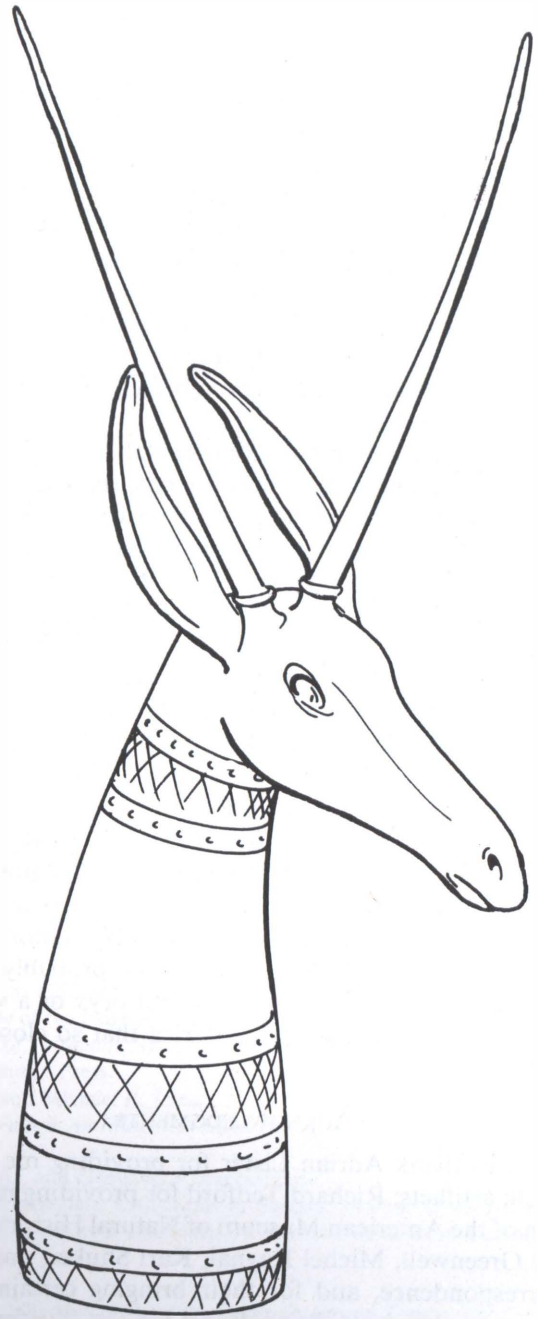

FIG. 9.—Iron cast reproduction of an African Tji Wara. Original probably in wood, and from Kenya. (Property of the author.)

Yet it is possible that various fossil animals survived into at least recent enough historical times to have become part of folklore, and thus be depicted in archaeological artifacts, despite the fact that their fossil record does not extend into the Holocene. (Numerous examples exist of presumably extinct animals with fossil records that terminated a considerable time ago, but which have then been found alive. The best known example is that of the coelacanth fish *Latimeria.* Coelacanths are not found in the fossil record beyond the end of the Cretaceous period, 65 million years B.P.) The significance of such artifacts is more likely to be noted by paleontologists than by archaeologists because of their familiarity with animals represented in the fossil record. This is particularly true, for example, in the case of the giant hyrax, as this animal has never even been depicted in the semi-popular literature.

My personal opinion on this entertaining catalogue of artifacts is as follows. The "sivatheres" presented here may merely represent stylized deer, yet Colbert's (1936) description of the probable *Sivatherium* statuette is highly convincing, as is the petroglyph depicted by Savage and Long (1986), and this lends some credence to my contention that *Bramatherium* might also have persisted into relatively recent (historical) times, and may be represented in at least some, if not all, of these artifacts. The "chalicothere" is problematical, especially in its possession of a tail. However, oral traditions and eyewitness reports of possible chalicotheres exist in Africa, and I am not convinced that the Siberian plaque depicts a wolf, if only for the reason that other canids (dog-related animals) are accurately depicted in the same collection. As to the giant hyrax, as someone who has kept hyraces as house pets for five years—and who can thus only too well recognize a hyrax on first sight—I am fairly convinced that the Chinese statuette is truly a representation of *Pliohyrax.* My only regret is that the horse-like hooves imply that the animal was probably fashioned from folk memory, and that mounting an expedition to China to look for it would probably be futile! Finally, the Tji Wara sculpture may well represent an oryx or a waterbuck, yet the existence of a Pleistocene antelope in Africa that so closely resembles this artifact is intriguing.

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